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EXAMINER

JONES, SCOTT E

ART UNIT PAPER NUMBER

3713

DATE MAILED: 03/09/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/896,150

Applicant(s)

PAUL ET AL.

Examiner

Scott E. Jones

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. This office action is in response to the amendment filed on August 20, 2003 in which applicant amends claims 1-3, 5-8, and 12, cancels claim 11, corrects figures 3 and 7, and responds to the claim rejections. Claims 1-10 and 12-13 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holliman et al. (U.S. 6,075,557) in view of Birchfield.

Holliman et al. discloses an image tracking system for computer games which is configured to present a sequence of images, determine the position of a target image in a previous presented image in the sequence, determine the movement of the target image between the previously presented image and the subsequently presented image in the sequence as the determined position modified by the determined movement providing a rapid indication of the position and motion of the target (such as a user's head). Furthermore, Holliman et al. discloses objects, such as a user's eyes, are tracked based on color. Holliman et al. additionally discloses:

Regarding Claim 1:

- imaging a sequence of scenes including the head of a user of the computer
(Figures 8 and 13, and Column 11, line 58-Column 12, line 2);

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- comparing visual characteristics from a portion of a scene to a center of said portion of said scene to determine movement of the user's head within the scene wherein at least one of the visual characteristics is color (Column 7, lines 35-47);
- controlling the game in accordance with the movements (Column 1, lines 5-12).

Regarding Claim 2:

- the visual characteristics include color, shape, or location (Figures 8 and 13, and Column 11, line 58-Column 12, line 2).

Regarding Claim 3:

- the visual characteristics include a combination of static and dynamic characteristics. Although not explicitly disclosed, Holliman et al. inherently has each of these features. For example, the object tracked (user's head) moves and is dynamic, whereas, the background features like a wall or bookcase does not move and is static.

Regarding Claim 4:

- the step of modeling of the dynamic characteristics to yield an estimate of head position (Figures 8 and 13, and Column 11, line 58-Column 12, line 2).
Furthermore, as noted above, although not explicitly disclosed, Holliman et al. inherently has each of these features. For example, the object tracked (user's head) moves and is dynamic, whereas, the background features like a wall or bookcase does not move and is static.

Regarding Claim 5:

- the step of initiating the head tracking through a graphical user interface (Figure 1 (7)).

Regarding Claim 6:

- the graphical user interface provides a bounding box displayed on the screen to assist in targeting the user's head (Figures 13, 19, and 21).

Regarding Claim 7:

- further enabling a match in color despite differences arising from lighting and shadows (Column 11, line 58-Column 12, line 2).

Regarding Claim 8:

- further enabling a match in color within a threshold of hue (Figures 25-26, and Column 19, lines 1-67).

Regarding Claim 9:

- the step of comparing the visual characteristics includes a comparison of pixels from scene to scene (Figure 21, and Column 13, line 48-Column 14, line 42).

Regarding Claim 12:

- the step of segmented a region defined by a predetermined closeness of color as an estimate of target shape (Column 11, line 58-Column 12, line 2).

However, Holliman et al. seems to lack explicitly stating:

Regarding Claim 1:

- the step of finding a weighted average of color to compute the location based upon action of the user's head based on color alone.

Regarding Claim 10:

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- the step of determining if the user's head has moved outside the scene.

Regarding Claim 13:

- the step of continuing to track the user's head when moving in front of or behind a similarly colored object in the scene.

Birchfield's Elliptical Head Tracking Using Intensity Gradients and Color Histograms

technical paper teaches of reliable visual method and system for tracking an object, such as a user's head, in a complex environment using different criterion, such as shape and color.

Birchfield and Holliman et al. are analogous art because both are systems that utilize computers to track a user's head. Furthermore, Birchfield teaches:

Regarding Claim 1:

- the step of finding a weighted average of color to compute the location based upon action of the user's head based on color alone (Page 2, Column 2-Page 3, Column 1).

Regarding Claim 10:

- the step of determining if the user's head has moved outside the scene (Figure 3a).

Regarding Claim 13:

- the step of continuing to track the user's head when moving in front of or behind a similarly colored object in the scene (Figure 6).

It would have been obvious to one having ordinary skill in the art, at the time of the applicant's invention, to incorporate Birchfield's head tracking system in Holliman. One would be motivated to do so because Birchfield provides for a robust head tracking system that is

accurate enough to actively control the camera's pan, tilt, and zoom for long periods of time in order to keep the user's head in the field of view at a desired size.

Response to Arguments

4. Applicant's arguments filed August 20, 2003 have been fully considered but they are not persuasive.

5. Applicant's arguments, see page 2 and corrected figures 3 and 7, filed August 20, 2003, with respect to the objection to the drawings have been fully considered and are persuasive. The objection of figures 3 and 7 has been withdrawn.

6. Applicant's arguments, see pages 3, 4, and 6, filed August 20, 2003, with respect to the rejection to claims 1-13 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The rejection to claims 1-13 under 35 U.S.C. 112, second paragraph has been withdrawn.

7. Applicant's arguments with respect to claims 1-9 and 12 have been considered but are moot in view of the new ground(s) of rejection.

8. Regarding the rejection to claims 10-11 and 13 under 35 U.S.C. 103(a) as being unpatentable over Holliman et al. (U.S. 6,075,557) in view of Birchfield, Applicant alleges Birchfield does not teach or suggest finding a weighted average of color to compute the location of a user's head based upon color alone. However, the examiner disagrees. Birchfield describes how the color module alone is capable of controlling the camera's pan, tilt, and zoom in order to track a person (person's head) in an unmodified environment (Page 3, Column 1 and 2). Furthermore, Birchfield describes a model histogram is constructed by counting the pixels (each having color) inside the ellipse. The histogram intersection is then computed between the model

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histogram M and the image histogram I. Once the histogram intersection is completed, color scores are computed to percentages (Page 2, Column 2-Page 3, Column 1). Therefore, a weighted average, i.e. color score percentages, are used to compute the position of a person's head. Therefore, the combination of Holliman et al. and Birchfield renders the claimed invention obvious.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Scott E. Jones whose telephone number is (703) 308-7133. The examiner can normally be reached on Monday - Thursday, 6:30 A.M. - 5:00 P.M..


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teresa Walberg can be reached on (703) 308-1327. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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